Natural History Professorship at St. Andrews. This post he held till 1882, when he was appointed Regius Professor of Natural History in the University of Aberdeen; and here he died in harness, respected and esteemed alike by colleagues and pupils. The degrees of M.D. (Edinburgh) and D.Sc. he took in due course; and he was also Ph.D. of Göttingen. In 1888 he was the recipient of the Lyell medal from the Geological Society. He also held the Swiney Lectureship in Geology from 1877 to 1882, and a second time from 1890 to 1894, when it had come under the direction of the Trustees of the British Museum. He was elected a Fellow of the Royal Society in 1897.

Although his life's work covered a very wide field, perhaps Nicholson's best claims to distinction will rest on his researches into the structure and affinities of the Stromatoporoids and the Graptolites. But, although all his conclusions did not meet with general acceptation, it would be unfair not to mention also his works on the Monticuliporoids and the Palæozoic Tabulate Corals. And here it should be observed that, through no fault of his own, his investigations of these latter groups took place a little too early; so that when the results of the *Challenger* discoveries became known, several modifications of view were rendered necessary. The older rocks of the Lake District likewise claimed a large share of his attention; many of his summer vacations being diverted, with a genial companion, to the elucidation of the difficult problems they present. His claims to distinction as a palæontological student of the lower Invertebrates are recognised by the dedication to him of the recently described *Millestroma Nicholsoni*. The important part he played in determining the rock-succession in the Lake District must not be forgotten in estimating his achievements. Nicholson's most widely-known monument will, however, undoubtedly be the large series of zoological and palæontological text-books, which have rendered his name a household word in every science-school and university where the English tongue is spoken. These had but comparatively humble beginnings; and it is to the credit of their author that, as they acquired a wider and wider reputation, he rose to the occasion by endeavouring to bring the later editions to a higher level than that on which he had started. Whether the plan of separating palæontology from zoology proper is the best that could have been devised, or the one likely to be followed in the future, this is neither the place nor the occasion to enquire. But, from a student's standpoint, it may be admitted that the first volume of the last edition of his "Palæontology" is almost the ideal of what a text-book should be. Personally, we knew him as a teacher only by a too brief portion of his last series of Swiney lectures; but, apart from the testimony of those who have enjoyed more favourable opportunities, his books are sufficient to proclaim how admirably suited he was for the important position he occupied with so much distinction.

The University of Aberdeen will have no easy task to secure a worthy successor! R. L.

NOTES.

A full biography of the Polish philosopher Hoené-Wronski has been in preparation during the past seven years. Wronski resided in London in 1820–22, and Mr. Zenon Przesmycki, who has the work in hand, would be very grateful for any further information, or access to correspondence, bearing on Wronski's life during that period. Mr. Przesmycki was in London last summer, and through the kindness of the authorities of Greenwich Observatory, the Admiralty, Royal Society, British Museum, and Record Office, he was able to consult various important documents. But no trace was found of a paper ("Réforme de la théorie mathématique de la terre") of his, presented to the Royal Society in June 1820, by the hands of the Astronomer Royal, Mr. Pond, nor of two printed extracts of this paper which Mr. Pond was authorised by the Society to make; their titles being (1) "Extrait du mémoire de M. Hoené-Wronski sur la théorie de la terre"; (2) "Nouveaux extraits du mémoire de M. Hoené-Wronski et de son appendice, principalement sur la théorie des fluides, 1821." The publication now of these facts, and that when in London Wronski corresponded frequently with Pond, with the mathematician Davies Gilbert, with the Rev. Mr. Nolan, and with Lord Melville, then First Lord of the Admiralty, and that he resided in Thiot's Hotel, at 15 Bucklersbury Square, may help to the discovery of further particulars. Dr. Alexander Galt, of Glasgow University, will be glad to receive, for Mr. Przesmycki, any information upon these matters.

At its annual meeting, on January 10, the Russian Academy of Sciences awarded its Helmersen premium to A. Mickwitz for his work, "Die Brachiopoden. Gattung *Obolus*, Eichwald"; the Lomonosoff premium to N. I. Andrusoff for his work, "The fossil and the living *Dreissenidae* of Eurasia"; to E. Burinsky, for his improvements in photography; and to P. I. Brounow, for his works in meteorology. The large Tolstoi medal was awarded to L. Besser and K. Ballod, for their researches into the natality and mortality of the populations of European Russia, the Baltic provinces, and different countries of Europe, including Great Britain; and the small medal to P. G. Matsokin, for a MS. work on the half-breeds of Transbaikalia.

Prof. Ray Lankester makes the welcome announcement that arrangements have been made for the supply of electric lighting to the Natural History Museum, South Kensington. The electric light will be gradually introduced into the various parts of the building—first of all into the offices and studies of the staff and the workshops in the basement, and then into the various public galleries.

Herr J. Bornmüller starts this month on a botanical expedition to the less-known mountains of Northern Persia.

Dr. Don Francisco P. Moreno, director of the La Plata Museum, and commissioner of the Argentine Republic in the boundary delimitation with Chile, has arrived in London from Buenos Ayres.

We regret to read, in the *Athenaeum*, that, in a fire which broke out in the physical laboratory of the University of Geneva, Prof. Chodat has lost the whole of his valuable herbarium, together with two hundred botanical drawings, the result of ten years' labour. A large number of botanical specimens, lent by other institutions, have also been destroyed.

A series of lectures will be delivered in the Lecture Theatre of the South Kensington Museum on the following Saturdays, at 3.30 p.m.:—January 28 and February 4, Dr. W. J. S. Lockyer, "Astronomical Instruments"; February 11 and 18, Mr. J. H. Pollen, "Furniture"; February 25 and March 4, Mr. William Burton, "Pottery."

The Nicaragua Canal Bill has passed the U.S. Senate. The Bill provides for the construction of the canal by the present Nicaragua Maritime Canal Company. The United States will control the canal, and own all the stock except 7½ per cent. given to Nicaragua and Costa Rica. Each of these will have one director, the United States appointing five. The neutrality of the canal is guaranteed by the United States. The canal is to be used by all nations at equal tolls. It is to be completed within six years. Its cost is limited to 115,000,000 dollars, and not more than 20,000,000 dollars are to be expended annually.

Science announces the death, at Philadelphia, of Dr. E. Otis Kendall in his eighty-first year. Dr. Kendall was for more than fifty years professor of mathematics in the University of Pennsylvania, though recently he had relinquished active duties. He had also held the chair of Astronomy in the University, and was for a long time dean of the scientific department, and was in 1883 elected vice-provost, being honorary vice-provost at the time of his death. Dr. Kendall was for twenty-eight years one of the secretaries of the American Philosophical Society, and for the following twenty-one years one of its vice-presidents. He was the author of a text-book of astronomy and of various contributions to mathematics, as well as of computations for the U.S. Nautical Almanac and the U.S. Coast and Geodetic Survey.

THE death is announced of Dr. Joseph Coats, professor of pathology in the University of Glasgow. Dr. Coats was born in 1846, and he received his preliminary education at Paisley and his medical education at the Universities of Glasgow, Leipzig, and Würzburg. He was appointed editor of the *Glasgow Medical Journal* in 1878, and was degree examiner in pathology 1879-82, lecturer on pathology 1890-94, and professor of pathology since 1894 at the University of Glasgow. He was president of the Pathological Society in 1876, and president of the Medico-Chirurgical Society in 1891. He was the author of several medical works, and he also contributed numerous papers to the various learned societies and medical journals.

THE Paris correspondent of the *Lancet* reports that Dr. Dumontpallier has died at the age of seventy-four years. He was a member of the Academy of Medicine, president of the Society of Biology, an Officer of the Legion of Honour, and was for many years physician to the Hôtel Dieu. Of recent years he has been best known by his researches into hypnotism and hypno-therapeutics, in which he had a great belief.—The death is also announced of Dr. Camille Dareste, professor at the Paris School of Anthropology. He was best known for his researches in embryology, and was practically the founder of the science of experimental teratology, while his researches on the artificial production of monsters created very widespread interest. He was formerly the professor of medicine at Lille, and some fifteen years ago went to Paris as director of the school for higher education.

A SERIES of severe earthquake shocks occurred in some parts of Greece on Sunday morning. The *Times* correspondent at Athens reports that nearly the whole Peloponnese was visited by the disturbance. Severe shocks were felt at Corinth, Megara, Tripolis, Sparta, Gythium, Patras, and Pyrgos, but little damage was done at these places. Messenia, however, experienced the full force of the earthquake, and, besides considerable destruction of property in the towns of Philiatra and Kyparissia, two or three neighbouring villages are reported to be in ruins or uninhabitable. Prof. Milne states that the earthquake reached the Isle of Wight at 8h. 24m. 55s. on Sunday morning. There were preliminary tremors for three minutes, and then three shocks, followed by the usual echoes or reverberations, three in number.

THE Swiney Prize for the present year has been awarded to Dr. J. Dixon Mann, Professor of Forensic Medicine and Toxicology at Owens College, Manchester, for his book on "Forensic Medicine and Toxicology." The prize, in accordance with the will of the testator, is awarded on every fifth anniversary of his death to the author of the best published work on jurisprudence. It consists of a silver goblet of the value of 100*l.*, with money to the same amount. Dr. Swiney died fifty-five years ago, and the award has been regularly made every fifth year to the present time. The Society of Arts are the trustees of the fund, and the award is made by that Society and the Royal College of Physicians. Having regard to this fact, the prize has up to the present date been given alternately for works on general jurisprudence and on medical jurisprudence.

A MEETING of the Institution of Mechanical Engineers will be held on Thursday and Friday, February 9 and 10, at the new house of the Institution, Storey's Gate, St. James' Park. The chair will be taken by the president at half-past seven p.m. on each evening. The annual report of the council will be presented to the meeting on Thursday, and the annual election of the president, vice-presidents, and members of council will take place on the same day. The retiring president, Mr. Samuel W. Johnson, will induct into the chair the president-elect, Sir William H. White, K.C.B., F.R.S. The following papers will be read and discussed, as far as time permits:—Fifth Report to the Alloys Research Committee: Steel, by Prof. Roberts-Austen, K.C.B., F.R.S.; Machinery for book and general printing, by Mr. William Powrie; Evaporative Condensers, by Mr. Harry G. V. Oldham.

THE following particulars, referring to the experiments made by the Wireless Telegraph Company between the South Foreland lighthouse and the East Goodwin lightship, are given in the *Electrician*:—Permission was granted by the Trinity House authorities for the Company to make use of either the East-Goodwin, the Gull-stream, or the South Sand-Head light-vessel—the land station to be at the South Foreland lighthouse—and they chose the furthest off of these light-vessels, namely, the East Goodwin lightship, which is twelve miles distant from the South Foreland lighthouse. All the apparatus was brought on the lightship in an open boat and rigged up in the course of an afternoon, and on Christmas Eve the lightship and lighthouse were placed in perfect telegraphic communication. Many messages passed on that day, and there has not been the slightest hitch from the starting of the installation to now, every message sent from either shore or ship being perfectly received at the corresponding station. Although the weather has been most tempestuous since the instruments were installed, they have not been in the slightest degree affected.

TWO papers upon the subject of steel rails were read at the meeting of the Institution of Civil Engineers on January 17. Mr. W. G. Kirkaldy recounted how experiments he had carried out on two steel rails, which had broken under traffic, had led to his devoting special attention to the subject and to a wider investigation. It was found that the breakage of rails resulted from failure commencing at the top surface, and not from the bottom, as appeared to be the usual belief, and that the deterioration was confined entirely to the top or running head. The deterioration was of the nature of a mechanical hardening of the surface under the action of the rolling load. In some cases this hardening further developed into a species of disintegration by the formation of minute transverse cracks, which, by gradual deepening, ultimately resulted in failure, unless the rail was removed in time.

PROF. W. C. ROBERTS-AUSTEN, K.C.B., F.R.S., at the meeting referred to above, gave a statement of the principles which guide microphotography of steel rails. The most generally useful information as to the structure of a steel rail is obtained by treating a highly polished surface of the section with an effusion of liquorice in water, which stains the pearlite a dark tint, and leaves the ferrite unacted upon. The most convenient magnification is between 100 and 150 diameters. Normal rails have thus been shown to consist of patches of pearlite set in ferrite; and although the structure is common to all rails, the ratios of the areas differ widely, the amount of carbon increasing with the area of the pearlite. If the ferrite is arranged in large, enclosed polyhedrons, the temperature to which the rail was raised before rolling was too high. The strength and intensibility increase as the size of the grain diminishes; and closely interlocking ferrite and pearlite represent the condition which most favours the prolongation of the life of the rail.

IN connection with the works now being carried out for the construction of the new Vauxhall Bridge, the contractors have erected a suspension cable way across the Thames, for the purpose of conveying material from the shore to the different parts of the works. The length between the supports, each of which is 80 feet above the ground, is 910 feet; and the main cable, which is made of steel, is 6½ inches in circumference. The cost of this cableway is about 2000*l*.

A CIRCULAR, appealing for additional telegonic work, has been sent to biologists, and others whose interest in the subject is known, by Messrs. Alex. Meek and G. P. Bulman. In the course of the note it is remarked: "After a careful study of the facts already ascertained regarding telegony—that peculiar phenomenon of cross-breeding, popularly termed "throw-back"—we see that these can be attributed to reversion with almost as much likelihood as to telegony." It is, however, believed that telegonic effects are sometimes shown by the offspring; but more experiments are needed, and the circular indicates the kind of information required. Messrs. Meek and Bulman are conducting as many experiments as they can; but telegony is without doubt of extreme rarity, and the more trials that are made, the greater is the chance of success. Those who will assist are invited to send the skins of the parents and young which display telegony; also, in the case of birds, to send an egg out of each batch. All communications should be addressed to Mr. G. P. Bulman, Durham College of Science, Newcastle-upon-Tyne.

MESSRS. MAYER AND MÜLLER, of Berlin, are publishing in three volumes the mathematical correspondence of Gottfried Wilhelm Leibnitz, under the editorship of C. J. Gerhardt.

A CORRESPONDENT, writing in the *Journal of Applied Microscopy*, suggests that a convenient "pointer" for class demonstrations with the microscope may be made by cementing a human hair to the diaphragm of the eye-piece, projecting into the centre of the field. A better plan would be to cement the hair to a circular ring of blackened paper or cardboard, which could be placed on the diaphragm or removed at will.

A NEW bi-monthly journal has been started in Paris, bearing the title *L'Enseignement Mathématique*. It is to be devoted to discussion of methods of teaching mathematics, with the object of forming a medium of intercommunication between professors and others engaged in this particular branch of teaching. The first number bears the date January 15, 1899. The editors are Dr. C. A. Laisant (Paris) and Prof. H. Fehr (Geneva), and the publishers are MM. Georges Carré and C. Naud, 3 Rue Racine, Paris.

IN the *Nuovo Cimento*, 4, viii., Drs. V. Boccara and A. Gandolfi describe experiments on the velocity of propagation of Hertzian waves, undertaken for the purpose of verifying the well-known relation $v = 1/\sqrt{(k\mu)}$. The media operated on consisted of mixtures, in various proportions, of paraffin and finely pulverised iron. Both the magnetic permeability and the specific inductive capacity could be increased by increasing the proportion of iron, and the index of refraction for electromagnetic waves was found to increase correspondingly, its value (n) being given approximately by the relation $n = 1/\sqrt{(k\mu)}$. This relation may, therefore, be regarded as verified experimentally.

A NEW departure in connection with projection microscopes has been constructed for Prof. M. C. White, of Yale University, in the form of an objective of 20 mm. focal length, and an estimated numerical aperture of 0·95. According to the *Journal of Applied Microscopy*, the new objective is a magnified copy of a 5 mm. apochromatic, the diameters and radii of curvature of all the lenses being increased fourfold. Dr. White's theory is that if, in using the ordinary microscope, a certain angular aperture is required to secure proper definition with a magnifying power of, say, 1000 diameters, then a similar aperture will be necessary to secure good definition in an image projected on the screen, even if it is obtained with a three-fourths-inch objective, and a projection eyepiece. The new lens has been manufactured by the Bausch and Lomb Optical Company.

IN experiments upon the discharge of negative electricity by light, the electric arc is usually employed as the source of ultra-violet rays, and a question arises as to how far such experiments are affected by the electrical state of the vapours of the arc. The *Physical Review*, vol. vii. pp. 129–148, 1898, contains an article on this subject by Messrs. Merritt and Stewart. It was pointed out by Hallwachs, in 1890, that the protection offered by a quartz window and wire gauze is in some cases insufficient to screen the direct electrical action of the arc vapours from the actino-electric apparatus. The electrical properties of the arc vapours are similar to those of gases that have been acted upon by X-rays, or to gases from a flame. It is supposed in these cases that a condition is developed in the gas somewhat similar to that in an electrolyte, *i.e.* ions are formed, some carrying positive charges and others negative charges. This condition is only temporary; in the case of X-rays the gas loses this ionised state in about one-tenth of a second. A charged body placed in the ionised gas would attract one set of ions and repel the other. Upon coming into contact with the charged body the ions are supposed to give up their charges and to cease to exist as ions. The experiments of Messrs. Merritt and Stewart show that, except at low potentials, the rate of discharge is not proportional to the potential, but approaches a limiting value as the potential is raised. The discharging power is retained even after the arc vapours have been passed through long tubes of glass or of metal, and lasts for at least ten seconds. There is some evidence that the negative ions diffuse more rapidly than the positive ones. If air or oxygen saturated with water-vapour is introduced into the enclosure containing the arc, the conducting power of the arc vapours is greatly increased. But this effect can no longer be observed when the body to be discharged is at considerable distance from the arc.

FROM the Geological Survey of Canada we have received several essays reprinted from the Annual Report, vol. ix., 1898. A report on the geology of the French River Sheet, Ontario, by Dr. Robert Bell, is a concise explanation of one of the Geological Survey maps (Sheet 125), printed in clear type, accompanied by a colour-printed map on the scale of an inch to four miles, and issued at the price of ten cents! Laurentian, Huronian, Ordovician, and Silurian rocks are described, as well as Glacial and other superficial deposits. Among "economic minerals" it is observed that certain white quartzites would furnish excellent material for making glass.

MR. A. P. LOW reports on a traverse of the northern part of the Labrador peninsula from Richmond Gulf to Ungava Bay. Proceeding along the eastern shores of Hudson Bay, Mr. Low explored Richmond Gulf, which is separated from Hudson Bay by a high narrow ridge of Cambrian rocks, capped with trap, and forming cliffs which rise 500 to 1200 feet above the water. Between the Gulf and Clearwater Lake there is a plateau, having a general elevation of 750 feet, formed of rounded granitic hills, with numerous intervening lakes. North of Clearwater Lake is Seal Lake, which derives its name from the seals living in its waters. Mr. Low thinks that the presence of these animals in the lake, which is nearly a hundred miles from salt-water, and at an elevation of nearly 800 feet above the sea, can hardly be due to migration, although the harbour seal is known to travel overland for considerable distances. He considers that the seal must have reached the lake during the subsidence of the land at the close of the Glacial period. It evidently breeds freely under the fresh-water conditions. Explorations were made by Mr. Low as far as Fort Chimo, the most northerly post of the Hudson's Bay Company in Labrador. The rocks met with along the greater part of the route have been classed as Laurentian; they consist chiefly of foliated granite. Other eruptive rocks, also cherty dolomite and shales, grouped as Cambrian, were met with. The observations of striæ and other Glacial phenomena showed that the region had been completely covered with ice during the Glacial period, and that the ice moved outwards and downwards from a narrow névé near the present watershed. Old marine terraces were also noted.

JUDGING from the twelfth annual report of the Liverpool Marine Biology Committee, the biological station at Port Erin, Isle of Man, was used by a number of naturalists last year, and several investigations of interest and importance have been made with material collected from the neighbouring coasts. An interesting illustration in the report is a reproduction of a photograph, taken in June 1897, of a marked area of rock covered with adhering animals. By the side is another picture of the same area photographed after a year's interval, and it shows that the original population had disappeared almost entirely. All the original limpets had gone, leaving their scars on the rock; but a few barnacles seem to have remained. Many thousands of new animals appear on the second picture.

THE second instalment of the "Additional Series" of the *Kew Bulletin* forms the first of a series of "Selected Papers," and is devoted entirely to vegetable fibres. It comprises eighty-nine papers, amounting to 280 pages, already published in the *Bulletin*, and forms a valuable work of reference for all interested in the subject, whether scientifically or commercially.

RETURNING to the subject of the injury inflicted on agriculture in New South Wales by the introduction of the prickly pear, Mr. Maiden, the Government botanist for the Colony, now publishes (*Miscellaneous Publication*, No. 253, Department of Agriculture) a description of the six species of *Opuntia* at present naturalised in the colony, each illustrated by a good full-sized plate.

THE first number of Cohn's *Beiträge zur Biologie der Pflanzen* published under the editorship of Prof. Brefeld, consists of three papers: on the witch-broom of the barberry, by Dr. J. Eriksson; on the development of the Helvellineæ, by Herr G. Dittrich; and on inulin, by Dr. H. Fischer. Dr. Fischer believes inulin to be a substance of much wider distribution in the vegetable kingdom than has generally been supposed. It is never a final, but always an intermediate, product in the process of assimilation. It may be formed by condensation out of fructose, which, after transport to the reserve receptacles, is again transformed into inulin, then into glucose, and finally into starch.

WE have received a reprint of a lecture on the South Wales Coal-field, by Mr. W. Galloway, being Subject I. of a course of lectures on mining, published by the South Wales Institute of Engineers. The lecture is illustrated by a capital colour-printed geological map showing the areas occupied by the steam-coal and anthracite collieries. The structure of the coal-field is well explained, and there is a general account of the mode of formation of coal, and of the organic remains of the Carboniferous period.

PROF. ARTHUR THOMSON will contribute a series of papers to *Knowledge*, dealing with the treatment and uses of anthropological data. The first article is to appear in the February number.

IN aid of the funds of the Distressed Gentlefolk's Aid Association, Mr. C. Carus-Wilson will lecture upon "The Marvels of Ice and Glaciers," at the Kensington Town Hall, on Wednesday, February 1, at 8.30 p.m.

"THE Resources of the Sea; or, an Inquiry into the Experiments on Trawling and the Closure of Areas," is the title of a work, by Prof. McIntosh, to be issued shortly by the Cambridge University Press. The work is accompanied by thirty-two tables, and various photographs and figures.

A COPY of an important paper on cell structure and nuclear division, entitled "Über Zellen- und Syncytienbildung. Studien am Salmonidenkeim," by Prof. Wilhelm His, has been received. The paper is an excerpt from the *Abhandlungen der mathematisch-physischen Classe der Königl Sächsischen Gesellschaft der Wissenschaften* (vol. xxiv. No. 5), and is illustrated by forty-one figures in the text.

TWO volumes (vols. i. and v.) of the "Traité de Zoologie Concrète," by Prof. Yves Delage and M. Hérouard, have already been noticed in these columns (vol. lviii. p. 25, May 1898). Another volume (vol. viii. pp. 379), dealing with the Chordata, and containing 54 plates and 275 figures in the text, has just been published. There will be nine volumes in all, only three of which have yet been published.

UNDER the title "The Last Link; our Present Knowledge of the Descent of Man," the paper read by Prof. Ernst Haeckel at the International Congress of Zoologists last August (see vol. lviii. p. 427), has been published by Messrs. A. and C. Black, with notes and biographical sketches by Dr. Hans Gadow, F.R.S. Prof. Haeckel states his case in eighty pages, and Dr. Gadow's biographical sketches, and instructive notes on the theory of cells, factors of evolution, and geological time occupy seventy-six pages.

THE Wagner Free Institute of Science, Philadelphia, has published the fourth part of Prof. W. H. Dall's memoir on the "Tertiary Fauna of Florida," with special reference to the silex beds of Tampa, and the Pliocene beds of the Caloosahatchie river, and including in many cases a complete revision of the generic groups described, and their American Tertiary species. The present part of the work includes the Priomodesmacea and Teleodesmacea. Prof. Dall expresses the hope that another part will conclude this series of papers, and comprise, besides the remaining descriptions, a summary of the faunal population of each of the principal Neocene horizons.

THE Vatican Observatory has recently issued volume v. of *Pubblicazioni* (xxiii. + 808 pages). The work is divided into four sections—astronomy (including observations of shooting stars), terrestrial magnetism, earthquake phenomena, and meteorology. The meteorological observations for the years 1893 and 1894, and ten-day and monthly means, are tabulated under each hour, in addition to the usual daily means and extremes. The whole work is beautifully executed, and contains some good astronomical and other plates. About 220 pages are devoted to a summary of the proceedings at the weekly meetings held at the observatory during the years 1894 and 1895.

THE annual report of the Smithsonian Institution for the year ending June 1896 has been received. It is well known that the value of Smithsonian Reports lies not so much in the account of the operations and conditions of the Smithsonian Institution as in the collection of papers on various scientific subjects, included in the appendix. The report of the Secretary on the work of the Institution is published many months in advance of the volume containing it and the appendix referred to. In the present volume this report, and general administrative affairs, occupy only 77 pages, while the appendix, containing a selection of papers (some of them original), embracing a wide range of scientific investigation and discussion, occupies more than six hundred pages. These pages consist of addresses delivered at scientific meetings, and upon other occasions, reprints and translations of contributions to scientific periodicals, and reports on some investigations carried on under the auspices of the Smithsonian Institution. There are thirty memoirs of this kind in the present report, and together they form a most interesting statement of work and progress in many branches of science.

THE additions to the Zoological Society's Gardens during the past week include two Arabian Baboons (*Cynocephalus hamadryas*, ♂ ♀) from Arabia, presented by Dr. H. O. Forbes and Mr. W. R. Ogilvie-Grant; a Rhesus Monkey (*Macacus rhesus*, ♀), a Macaque Monkey (*Macacus cynomolgus*, ♂) from India, presented by Mr. P. de Loriol; a Patas Monkey (*Cercopithecus patas*, ♂) from West Africa, presented by Mr. C. H. Wimpress; a Black-backed Jackal (*Canis mesomelas*) from South Africa, presented by Mr. Fraser; a Nankeen Night Heron (*Nycticorax caledonicus*) from Australia, presented by Mr. John Brinsmead; two Diamond Pythons (*Python spilotes*) from Australia, presented by Mr. S. A. Michels; a Grey Lemur (*Hapalemur griseus*) from Madagascar, an Argali Sheep (*Ovis ammon*, ♂) from the Altai Mountains, deposited; four Ruddy-headed Geese (*Chloephaga rubidiceps*), bred in Holland, purchased.

OUR ASTRONOMICAL COLUMN.

COMET CHASE.—The following ephemeris for Comet Chase will be found serviceable by those who wish to observe this object. It has been calculated by Herr J. Möller, and is as follows:—

Berlin Midnight.

1899.		R.A. (app.). h. m. s.		Dec. (app.). ° ′
Jan. 27	...	11 9 35	...	+33 35·9
29	...	9 16	...	33 57·9
31	...	8 52	...	34 19·5
Feb. 2	...	8 23	...	34 40·5
4	...	11 7 48	...	+35 1·0

The brightness of the comet is about the same as at the time of discovery.

NEW VARIABLE STAR IN ANDROMEDA.—Dr. T. D. Anderson announces (*Astr. Nachr.*, No. 3539) a new variable star in Andromeda, the approximate position of which for 1855 is

$$\text{R.A. } 2^{h}\ 8^{m}\ 23^{s} \quad \ldots \quad \text{Dec. } +43^\circ\ 37'{\cdot}8$$

Using for comparison stars BD + 43°·457, 460 and 462, and estimating their respective magnitudes as 9·2, 8·8 and 9·7, he found the following values for the magnitude of this variable:—

1898 Dec. 3	...	...	Mag. 9·1
6	...	...	9·1
28	...	...	9·5
1899 Jan. 3	...	...	9·6
7	...	...	9·7

The star has thus rapidly decreased six-tenths of a magnitude in this short period, and it will be interesting to follow the variation further.

WITT'S PLANET (433) DQ.—The recent *Harvard College Observatory Circular* (No. 36) gives an account, with the results, of a search for the planet Witt among some negatives of star regions taken at that observatory. With the help of Mr. Chandler, who furnished an ephemeris based on the best material, Mrs. Fleming undertook the examination of the plates for the year 1894; but in the first instance, although the latter examined a region covering 1300 square degrees, the planet was not found. The next search was made upon the plates taken in 1896, as the errors of the ephemeris would not then be so great, and might possibly compensate for the extreme faintness of the planet. The result of this search was that at last a faint image was found on a plate taken on June 5, 1896, and this was confirmed on plates exposed on June 5 and 6.

From these positions the ephemeris was corrected, and positions for 1894 computed. A further examination by Mrs. Fleming brought to light impressions of the planet on several other plates taken in 1894 and 1893, In addition to the positions of the planet at the times each of these photographs was obtained, Prof. Pickering publishes in the present *Circular* an ephemeris from 1893 October 27 to 1894 April 21, computed by Mr. Chandler from a combination of the observations of 1898, and the photographs taken on December 19 and 27, 1893; February 16, 1894; April 6, 1896; and June 4 and 5, 1896.

The elements calculated by Mr. Chandler from such a combination of positions are the following:—

Elements.

Epoch 1898, August 31·5 G.M.T.

$$\begin{array}{l}
M = 221^\circ\ 35'\ 45''{\cdot}6 \\
\left.\begin{array}{l}
\omega = 177\ \ 37\ \ 56{\cdot}0 \\
\Omega = 303\ \ 31\ \ 57{\cdot}1 \\
i = 10\ \ 50\ \ 11{\cdot}8
\end{array}\right\}\ 1898{\cdot}0 \\
\phi = 12\ \ 52\ \ 9{\cdot}8 \\
\mu = 2015''{\cdot}2326 \\
\log a = 0{\cdot}1637876 \\
\text{Period} = 643{\cdot}10\text{d.}
\end{array}$$

It may be mentioned that further images of the planet have been found on plates taken in November 26, December 23, 1893, and in January 19, 25, 30, and February 5 of the following year.

On a previous occasion in this column (December 1, 1898, p. 108) we drew attention to a suggestion by Prof. Chandler, who gave his reasons why Pluto would be an appropriate name for this new planet. In the *Astronomische Nachrichten* (No. 3539), Dr. G. Witt, the discoverer of the planet, proposes to call it by the name Eros, hoping that this will be found suitable for such an important little body.

THE HAMBURG OBSERVATORY.—Prof. F. Küstner, the director of the observatory at Bonn, has been appointed to take over the directorship of the Hamburg Observatory, in succession to Prof. G. Rümker, who has, we are sorry to say, retired owing to prolonged illness.

THE LEONIDS IN 1898.—Several additional accounts of the observations of the Leonids at different stations are published in the *Astronomische Nachrichten* (No. 3538). Those made at Vienna and Pola seem of special interest. In Vienna the three nights of the 13th, 14th and 15th were useless for observation; but Dr. Palisa, with Herr J. Rheden, ascended the "Semmering," and were fortunate in having clear weather after midnight on the night of the 13th. Between 3h. and 5h. 30m. twenty-two meteors were seen, thirteen of which were Leonids, but all below the second magnitude. On the evening of the 14th, Prof. E. Weiss also ascended to this point, taking with him two photographic cameras. Between 3h. 15m. and 5h. 45m. about 250 meteors were seen, two-thirds of which were estimated as Leonids, and several brighter than Venus. On the photographic plates six trails were recorded, one of which belonged to an interesting meteor which was observed to be as bright as Jupiter, and came from the radiant R.A. 153° + 23°. On the night of the 15th, Dr. Palisa and Herr Rheden, observing from the same station between 10h. 45m. p.m. and 2h. 30m. a.m., saw fifty meteors, many of which were very bright, but only about twenty-five of them Leonids. These observations indicate that the forerunners of the swarm reached the earth in the night of the 13th–14th, the maximum being reached probably during the day of the 15th. Prof. Weiss adds that the passage through these meteors lasted for more than twenty-four hours, suggesting